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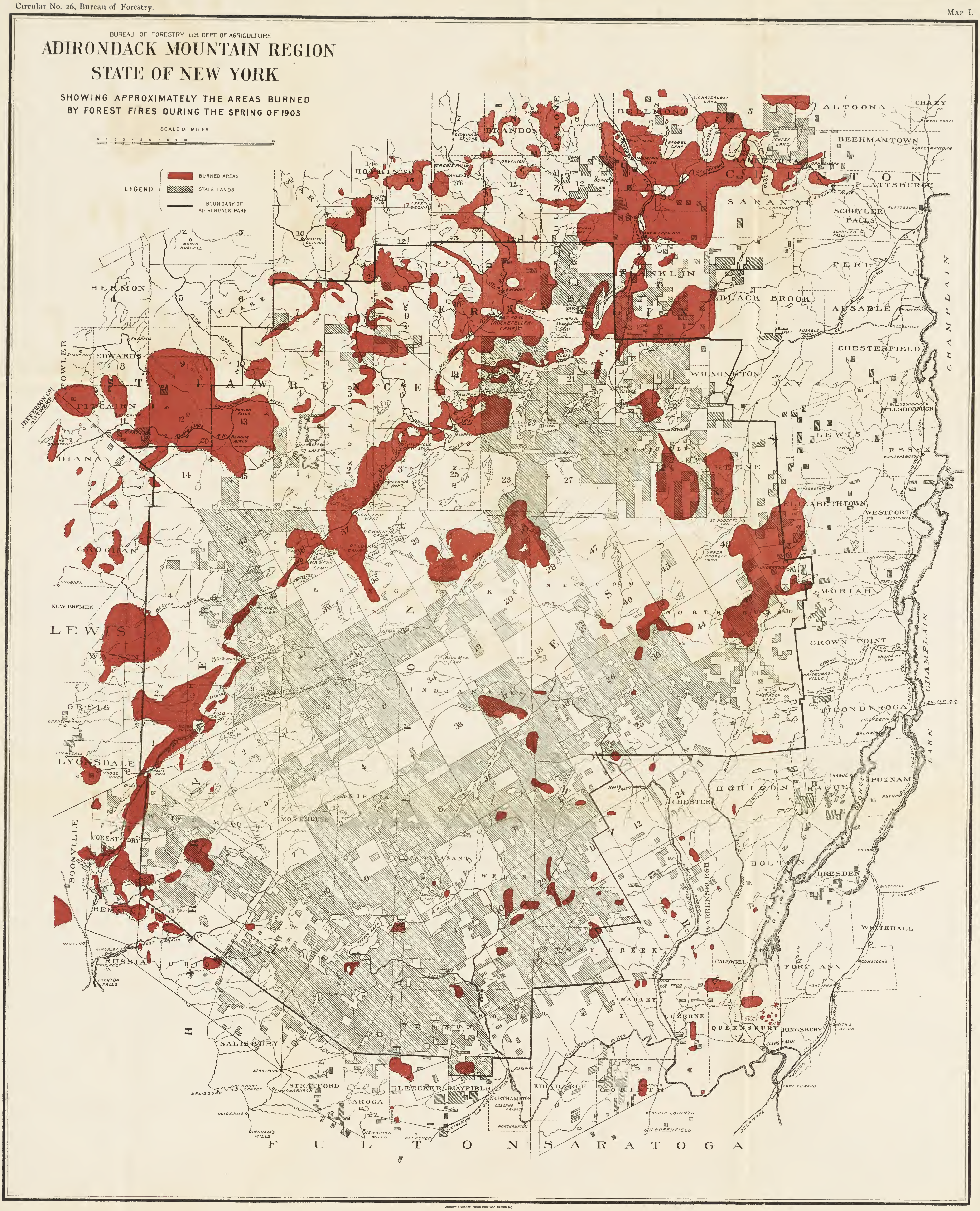
FOREST FIRES IN THE ADIRONDACKS IN 1903.

By H M. SUTER,
AGENT, BUREAU OF FORESTRY.



BUREAU OF FORESTRY U.S. DEPT. OF AGRICULTURE

ADIRONDACK MOUNTAIN REGION
STATE OF NEW YORK

SHOWING APPROXIMATELY THE AREAS BURNED BY FOREST FIRES DURING THE SPRING OF 1903

ANDREW B GRAHAM PHOTO-LITHO WASHINGTON DC

ILLUSTRATION.

Map of Adirondack Mountain region, State of New York, showing approximately the areas burned by forest fires during the spring of 1903 (frontispiece).

United States Department of Agriculture,

BUREAU OF FORESTRY—CIRCULAR NO. 26.

GIFFORD PINCHOT, Forester.

U. S. Department of Agriculture,
Bureau of Forestry,
Washington, D. C., February 27, 1904.

Sir: I have the honor to transmit herewith a report entitled "Forest Fires in the Adirondacks in 1903," by H. M. Suter, Agent in the Bureau of Forestry, and to recommend its publication as Circular No. 26 of the Bureau of Forestry.

The map accompanying this report is necessary for its proper illustration.

Very respectfully,

Gifford Pinchot, *Forester.*

Hon. James Wilson,
Secretary of Agriculture.

FOREST FIRES IN THE ADIRONDACKS IN 1903.

EXTENT OF THE FIRES.

Between April 20 and June 8, 1903, over 600,000 acres of timberland in northern New York were burned over. About $175,000 was spent in fighting the fires, which nevertheless were finally extinguished only by the help of heavy rains. The total direct loss was approximately $3,500,000. No less serious, though incapable of money valuation, is the indirect loss due to the destruction of young growth which was to form the future forest. To this must be added the injury to the forest soil caused by the burning out of the vegetable matter indispensable to healthy tree growth.

The results of a study of the extent, causes, and effects of these fires made by the Bureau of Forestry are presented in this report. Agents of the Bureau traveled extensively through the region, made careful examinations of many of the burned areas, and gathered information from guides, cruisers, lumbermen, pulp manufacturers, and superintendents of private preserves. Reports were also obtained from the fire wardens of all the towns within and near the Adirondack Park.

In each town the wardens and other well-informed persons were asked to indicate burned-over lands as closely as possible upon the large map of the Forest, Fish, and Game Commission. A careful study of burned-over lands along the lines of the New York Central and the Delaware and Hudson railroads was made on the ground by an agent of the Bureau.

The results, reduced in many instances against possible error, are shown upon the accompanying map. No surveys were made in this work, and therefore it is not asserted that the map is absolutely accurate. To have made it so would have required detailed surveys over a mountain region of approximately 7,000 square miles. Nevertheless, it is believed that the methods employed in the collection of data were such as to furnish fairly trustworthy and conservative results. Information was sought only from the best-informed men, of matters within their personal knowledge.

No attempt has been made to indicate upon the map the severity of the fire or the type of land burned over. The areas colored red indicate fires of varying degrees of intensity, both in virgin forest and on cut-over lands.

CONDITIONS WHICH LED TO FIRES.

Observations at the 12 Adirondack stations of the Weather Bureau show that during the winter of 1902–3 the average snowfall was nearly 8 inches less than the average of the past ten years. In April the rainfall averaged 2.2 inches, most of which fell before the 11th. No rain fell in April after the 17th. In May the average rainfall was about 0.2 inch, the least ever recorded in the Adirondacks for that month. In June, until the 7th, only traces of rain are reported. From the 7th to the 10th light local showers occurred. Heavy rains fell on the 10th, 11th, and 12th, and from then until the middle of August rain was frequent. But in the fifty-one days between April 16 and June 7 there was only about 0.2 inch of rainfall.

As a result of this protracted drought, the whole forest was inflammable to an unprecedented degree. On cut-over lands the débris left after lumbering was ready to catch fire like tinder, and to spread it almost like a powder magazine. Throughout the Adirondack region, which is one great forest, broken only by lakes, marshes, and clearings, every chance spark left unextinguished by smoker or camper, every glowing cinder from locomotive or brush-burner's fire, carried the potentiality of a great conflagration. This was at a season when fishermen were building camp fires and smudges in every direction. Under such conditions many incipient forest fires were and will always be inevitable. The only hope of preventing wide devastation at such times is through systematic watchfulness to extinguish every little blaze before it has had time to gather headway.

CHARACTER OF THE FIRES.

In general, the fires burned rapidly, owing to the inflammable condition of the forest. They were either "surface," "ground," or "crown," the type of fire varying with the character of the forest and the strength of the wind. Usually fire began on the surface, spreading among the leaves and dead branches. Where deep, dry duff was encountered, combustion worked to the bottom of the half peaty mass, stealing along, sometimes without much evidence above ground, possibly even days or weeks, later to develop into a surface or crown fire under favorable conditions. Among conifers, with their inflammable foliage, surface fires frequently mounted to the tops of the trees and thus became crown fires. This is the most dangerous and unmanageable form of fire, on account of the great surface offered to combustion, and also because of the powerful draft caused by the rising of the heated air, which fans the flames to uncontrollable fury.

Such fires have been known to travel with remarkable speed. In Newcomb last spring the warden and several men ran for 2 miles closely pursued by the fire, and finally escaped only by placing a lake between themselves and the flames.

In April a farmer near Lake Placid lost control of a fallow fire. It caught in the duff and smouldered there until the 3d of June, when an unusually strong wind fanned it into a surface fire, which traveled 8 miles in two hours and a half. It leaped clearings and streams. At times it proceeded through meadows, making a path only a few feet wide, and then, driven by the wind, burst into a roaring conflagration, which in a few hours devastated a tract 6 miles long by 3 in width.

BRIEF MENTION OF SOME OF THE WORST FIRES.

In the fire near Lake Placid, already mentioned, about 14,000 acres of land were burned over and almost every tree killed, including the largest hardwoods. In addition, Adirondack Lodge, a beautiful rustic hotel, its adjoining buildings, a shingle mill, several small dwellings, and a number of cattle were destroyed. The total loss from this fire is at least $150,000.

A fire in Keene Valley burned from Cascade to a point near St. Hubert's Inn, about 9 miles, while the Roaring Brook fire burned over 17,000 acres in the towns of Keene and Elizabethtown, and the Dix fire in North Hudson burned over 18,000 acres.

Twelve thousand acres of the Nehasane Preserve were burned, with much damage to the beauty of the preserve and interference with the results of a working plan of the Bureau of Forestry under which lumbering was being done. The handsome and expensive camp buildings were saved by city fire engines hurried in on the railroad from Herkimer and Ilion. Powerful steam pumps mounted in a freight car protected a narrow belt of trees along the track. Four hundred men fought the fire, at a cost of $6,000. The same fire burned over 5,000 acres of the preserve of Hon. William C. Whitney. The Brandeth Preserve near by lost 2,000 acres.

Doctor Loomis's camps on the west end of Little Tupper Lake were burned at a loss of $5,000, the Catlin Lake fire burned 10,000 acres, and 10,000 acres were burned over near Horseshoe Pond on the tract of Mr. A. A. Low. Ten thousand acres of the De Camp tract were burned over. Most notable of all were the fires of the Rockefeller Preserve, which devastated over 40,000 acres. Many of the fires on this tract originated under the most suspicious circumstances. Several hundred Italian laborers were imported from New York to fight the fires, but proved inefficient on account of the trying nature and novelty of the work.

Such were some of the large fires. But during the period between the last of April and the second week of June smaller fires numbered thousands, and their aggregate area exceeds that of the larger ones.[a]

LOSSES FROM FOREST FIRES.

The fires caused no loss of human life, although several narrow escapes occurred. A few domestic animals are known to have been killed.

For the game the results were more serious. The breeding and nesting season was at its height, and for this reason there must have been great loss of weak young animals and birds. Carcasses of several deer were found.

The trout suffered severely. In a number of towns dead fish were seen floating down the streams. In one case several bushels of fish were found washed up on the shore of a lake near an inlet. Along the West Branch of the Ausable River considerable destruction took place. On the Boquet River, two boys waded the stream and in a single day took 92 brown trout, weighing 74 pounds. The fish seemed hardly able to move, and were easily caught in the hands.

In shallow streams the heat alone was probably sufficient to kill the fish. In deeper streams it seems more likely that lye leached from the wood ashes, or the finely divided ashes themselves, had a poisonous effect.

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[a] It may be noticed from the map that many of the detached fires have small streams running through them. This probably indicates that the streams were used as waterways for removing the logs cut along their banks and about the headwaters. Where cutting was done, the open slash with its quantities of dry, dead wood offered the most favorable opportunity for the spread of fire. Also, the stream itself was a gathering point for fishermen during the month of May. Their pipes and the smudges built to keep off the black flies and mosquitoes account for the source of many of the fires. Sometimes fire ran fiercely in slash on private lands, but died out or was moderated to such extent that it could be extinguished upon reaching the line of State land, where the forest cover was so dense that enough moisture was retained to protect the timber.

In this connection the after-effects on trout streams must be taken into account. Trout require clear, cool water. The loss of heavy shade and the washing of impurities from burned areas into the mountain brooks can not but have an unfavorable effect on the fish.

The aggregate value in each county of property destroyed as reported from the best attainable source is presented in the following table:

County.	Owned by State.	Private property.	Total.	Cost of fighting fire.	Reported or evident loss.
	Area burned over.				
	Acres.	*Acres.*	*Acres.*		
Clinton [a]	700	20,300	21,000	$1,538	$11,510
Essex [a]	27,500	44,320	71,820	30,215	140,285
Franklin	37,675	193,575	231,250	34,486	754,225
Fulton	600	1,650	2,250	2,182	490
Hamilton	20,810	32,840	53,650	26,861	69,680
Herkimer	9,300	20,700	30,000	11,976	44,025
Lewis [a]	....	32,550	32,550	7,404	50,915
Oneida	....	15,100	15,100	2,485	4,850
St. Lawrence [a]	6,075	161,025	167,100	19,650	53,725
Saratoga	20	580	600	584	....
Warren	3,675	8,355	12,030	5,578	2,285
Total	106,355	530,995	637,350	142,959	1,131,990

[a] The parts of these counties which are more remote from the Adirondack Park line were not canvassed.

This comprises standing timber, logs, lumber, pulp wood, firewood, tan bark, logging camps, houses, barns, hotels, cottages, sportsmen's camps, bridges, and fences. All of these items are estimated at the commonly accepted value placed upon them in their locality. This varies considerably in case of forest products, according to the varying expense of transportation to market from more or less accessible localities. It would be highly misleading to rely only upon the last column of the table for the total loss, since it represents only the value of the timber, houses, and other property which were actually consumed. In estimating the total loss, the following considerations have been borne in mind:

(1) The total area injured by fire has not been considered as a basis for this report, but only burned-over lands within the Adirondack Park and its immediate neighborhood.

(2) The constant and evident tendency of corporations and heavy landowners within the area canvassed was to minimize their losses; no doubt, for excellent business reasons. One large paper company, which was known to have lost heavily, declined to give any information.

(3) The table makes no allowance for the considerable difference in

value between lands in private preserves and the rest of the Park. This difference is created by the special use to which the land is put, but is none the less actual and marketable. Land which is of practically no value for timber may be worth $25 an acre when included in a preserve. But it is worse than useless when burned over, since its ugliness depreciates the parts of the holding which may have been saved from the fire. A number of the Adirondack preserves were badly burned this year. The manager of one of them gives his loss as $225,000, though the actual commercial value of timber destroyed was probably not over $40,000.

(4) Damage to reproduction, or the young forest growth, should be considered a heavy loss, since upon it depends the forest of the future.

It will be seen that the accurate determination of the losses is an impossibility. The figures of the table form a basis for an estimate of the actual money loss, and these are known to understate the damage which was inflicted. The careful consideration of these data and of the modifying considerations mentioned has resulted in the belief that the total damage and resulting loss is not less than $3,500,000.

METHODS EMPLOYED IN FIGHTING THE FIRES.

In New York the official care of the State's interest in the Adirondack and Catskill forests, and the administration of the Adirondack and Catskill preserves, are under the direction of a superintendent of State forests. A chief fire warden has charge under him of all matters of fire protection and prosecution of offenders against the fire laws. Both of these officers are appointed by the Forest, Fish, and Game Commission. The commission also appoints a fire warden in each forest town, upon whom rests the responsibility of fighting all fires within his territory. The towns are usually divided into convenient districts, each of which is guarded by a deputy warden. These officers are empowered to order any able-bodied man out to fight fire, and have full direction of the work. The State shares equally with the town in paying for such labor if the warden certifies that the work was authorized by him and was actually performed.

Had there been no such organization the losses of this year would have been much more severe and extensive. In the main the wardens showed intelligence and zeal in the performance of their duties, and made a gallant fight against odds which were frequently overwhelming. In some cases they and their men worked fifteen hours a day for a number of consecutive days, some to be prostrated later by sickness following the long strain and complete physical exhaustion. The various communities and the State owe such men a debt which pay checks can not cancel. The blame for the avoidable loss lies rather with the system than with the men.

The most effective fighting was done from daybreak until about 9 o'clock in the morning. The fires were usually much deadened at this time of day, and the wardens took advantage of the fact, resting their men or acting chiefly on the defensive in the middle of the day, and renewing the attack toward evening, when the fires again lost some of their aggressiveness.

Surface fires were checked by raking away the litter on the forest floor in a path a few feet wide, which served as a line of defense from which the fire could be fought back as it approached. When water could be obtained the path was thoroughly wet down. Shovelfuls of sand were dashed upon blazing wood. Burning grass in the clearings was thrashed out with the bushy top of a young spruce or balsam, or a few furrows were turned with a plow across the track of the fire.

But usually the presence of duff made it necessary to dig a trench from 1 to 4 feet wide, down to the mineral soil, sometimes completely encircling the fire. The roots were cut through with axes and mattocks, and the mass of peaty material chopped up and shoveled out. Often the sand was heaped against the outer side of the trench to protect the duff from sparks and heat, when the fire burned through the inner side. Several wardens report digging 15 to 20 miles of such trenches.

When other methods failed or could not be used the wardens resorted to back firing. Often the fires became crown fires, or were of such volume and heat that men could not approach them. In such cases trenches were prepared, and fire was applied all along the side next the approaching forest fire. If the trenches could then be defended successfully for a short time, the fires thus set would burn a distance back from the trench, thus clearing away much of the combustible matter and robbing the conflagration of its energy when the two lines of fire finally met. Most of the wardens who employed this expedient report good success in its use, and some say that without it they could have made no effective defense at all.

These methods were fairly successful as long as enough help could be had and there was no strong wind. But about May 28 to June 3 (the latter being the worst day) high winds occurred in the Adirondacks, fanning smoldering fires into activity. As a result fire fighting became generally ineffective. The woods became so hot and smoky that everyone was compelled to take refuge in the clearings and to confine his efforts to an attempt to save the threatened cottages, camps, hotels, and farm buildings. The destruction of the entire region seemed not at all improbable, for in the dense pall of smoke it was impossible to tell where the fires were. In some localities these unseen fires could be heard distinctly, and the nights were almost as bright as the days from the glare. People frequently slept on the floors to avoid the smoke.

It was only the timely appearance of heavy rains, beginning June 7, that brought the fires under control. Hundreds of men dropped their tools that day and slept the sleep of utter physical exhaustion. Another week of strain would have beaten down all defense.

Fire fighting had been carried on practically without cessation for six weeks. It cost the State, local authorities, and corporations, taken altogether, somewhere in the neighborhood of $175,000. Each town must pay one-half its authorized fire bill. This will work hardship in many towns of small population, for the bills of some of them amount to as much as $10,000 or $12,000. To meet one-half this amount will require a decided rise in rate of taxation, or possibly the issue of bonds.

CAUSES OF FIRES.

Culpable carelessness was responsible for the largest part of the fires, deliberate incendiarism for no small number, and unavoidable accident for a few.

Inexcusable negligence and disregard of legal requirements and the rights of adjoining property has been charged against the railroads. Fully one-half of the fires due to carelessness caught from locomotives of the New York Central and the New York and Ottawa, and the Chateaugay, which upon June 1 became a part of the Delaware and Hudson system. A good many fires also were set from logging railways. The map shows how the burned areas follow the path of certain railroads. The laws of the State require the equipment of locomotives with spark arresters and the observance of other precautions against fire. Had the railroads been compelled to adopt these safeguards at the beginning of the dangerous season, much loss would have been averted. The railroads themselves will be heavy sufferers in the long run from the devastation for which they are so largely responsible. There was lack of proper patrol of tracks and indifference on the part of section men. Locomotives were not infrequently sent over the road hauling freight trains which taxed their capacity to the utmost. As a result sparks from the heavy exhaust were a constant cause of fire. For example, on May 5 a heavy excursion train, hauled by two locomotives, set almost continuous fires for 10 miles in the town of Fine.

Later in the season, and after the harm was done, locomotives were equipped with spark arresters. Ash pans and dampers were inspected thoroughly, freight trains were reduced to one-half their former tonnage, the apathy of the section men disappeared, and a track patrol was established.

Next to the railroads, fallowing, or the clearing of land by burning débris left after lumbering, was probably the most prolific source of fire. The law forbids such burning during the months of April and May, but permits it from June 1 until September 16 under the written permission of a fire warden. In the spring of 1903, and until after the rains of June 8, the setting of such a fire was simply to invite widespread damage from forest fires. Yet numbers of farmers burned fallow, some in the forbidden season of May, some under permit from wardens, and some without permits and in the face of the wardens' explicit warning. As a result, numbers of these fires escaped and burned over large areas of adjacent forest.

As usual, many fires were started through the carelessness of smokers. Smudges and camp fires imperfectly extinguished caused their full share of damage.

The forms of neglect or carelessness outlined above are responsible for a very large percentage of the actual acreage burned and damage done. There is, however, another serious aspect of the situation in the fact that probably 75,000 acres were burned over by fires deliberately set.

The rapid increase in the number and extent of private parks and game preserves in the Adirondacks, and the resulting decrease in the area open to all for hunting and fishing, have engendered strong feeling against private preserves upon the part of some who do not enjoy their privileges. In the spring of 1903 many of these private preserves were badly burned, one of the largest being burned over from end to end; nor is there valid reason for doubt that the fires upon them were largely of incendiary origin. One man familiar with the woods can set fires which in a few hours are practically beyond control. It is seldom possible to bring against him sufficient evidence to convict. The strong feeling in parts of the Adirondacks against private preserves is therefore an exceedingly serious menace of continued damage from fire.

Nor does the danger threaten private lands alone. The fact that the State constitution forbids the cutting or removal of timber, or even of firewood, from the State lands is a source of irritation to those in need of the timber which is going to waste.

The rate at which fire fighting is paid seems in many cases to defeat the end for which the money was provided. The law reads that not more than $2 per day may be paid for this labor, leaving the exact figures to be decided by the towns. Most of the towns paid the full $2 on account of the severe nature of the work. Two dollars a day is more than can be earned at anything else except guiding or skilled labor in this region. As a consequence, some fires were set to prolong the work by the very men who were employed to put them out.

Hunters set fire to encourage the growth of grass in the spring and thus attract the deer to a known locality. Berry pickers burned land to favor the growth of berry bushes, ginseng (or "sang") gatherers to make their work more easy and profitable. In one town boys were discovered setting fire after fire for the pleasure of seeing the men hurry to fight them. In another the warden saw smoke roll up, and hastening to the spot found the incendiary coolly enjoying the spectacle as the flames roared up a steep mountain side. This man had absolutely nothing to gain by his act, and ran some danger of losing his cabin had the wind changed.

A few entirely accidental fires are reported. In two cases sparks from burning buildings ignited surrounding woodlands. In two cases, one of which was the great fire which swept Nehasane, the cause is reported to have been the rays of the sun focused by curved pieces of broken glass, such as the side or bottom of a bottle. This is by no means as improbable as it sounds. In prairie States the careless scattering of broken bottles in the grass is censured by old settlers.

LESSONS OF THE FIRES.

It is a matter of regret that the provisions of the fire laws were not more rigidly enforced at the first signs of approaching disaster. But the hands of the Forest, Fish, and Game Commission are tied to some extent by the law. There is no provision made for paying a warden if he succeeds in preventing all fires in his town by exercise of unusual diligence. He can be paid only for time in which he was actually fighting fire. These men can hardly be expected to desert their private business and spend their time on State work without recompense.

Many wardens complain of embarrassment caused by the present system of paying the men employed by them. This money is always greatly delayed by the various processes of auditing and counterchecking through which accepted accounts must pass. As a result private persons or corporations who pay cash often hire the laborers away from the wardens. The latter of course have the legal power of ordering any able-bodied man to fight fire, but are chary of exercising this power, because they realize the hardships which must come to the families of these men if they are compelled to do work for which they may receive no pay for months.

Prosecutions of careless and willful fire setters were not so frequent as they might have been. Evidence in such cases is usually hard to get, and the wardens naturally dislike to antagonize their neighbors, sometimes for business reasons and not infrequently because of actual danger to themselves and their property. This difficulty seems inevitable under the present organization. However, a number of convictions were secured. One warden fined his brother for allowing a fallow fire to escape. The most effective example was made in Thurman, where a desperate character was sent to the State penitentiary at Dannemora for a year on a cumulative sentence. The warden was able to prove that this man set 24 fires in one day and tried to shoot a boy who discovered him at his work. A younger accomplice was committed to the reformatory at Elmira.

That many of the fires were caused by the railroads is the result not of inadequacy of the law, but of lack of effort to enforce it. Unless in the future the railroad which fails to equip its locomotives with spark arresters is prosecuted as vigorously as is the farmer who burns his fallow contrary to the instructions of the fire warden, fires will occur and the local sentiment necessary to the most effective protection of the forest from fire will not develop.

The recent fires have shown conclusively that the fire-warden service is not in itself sufficient. Its inherent weakness lies in the fact that the fire warden is not employed to prevent fires, but merely to organize a sufficient force to fight them when they come to notice. The thorough defense of the Adirondacks from fire is impossible until the fire-warden service is supplemented by a permanent force of rangers, who shall be continually on the lookout against fire. To work out the details of such a service would require careful study on the ground with that specific object in view. But it is firmly believed that the State of New York can effectively protect its forests from fire at a cost which represents no more than a reasonable rate of insurance upon the capital which these forests represent.

The need of a system of roads and trails in the Adirondack Preserve was clearly shown during the recent fires. The development of such a system will prove fully justified as a necessary and reasonable precaution.

Finally, the important lesson of the recent fires is that, should another long drought occur, the State would be powerless under present methods against fire to prevent a repetition of the calamity. The problem of the effective protection of the Adirondacks has not been solved because the necessary study on the ground has not been made. It is only by the organization of an improved fire service, based on such a study, that the State can combat the fire evil in an advantageous and economical manner, which involves extinguishing small fires promptly, and thus avoiding great expenditure in well-nigh hopeless struggles with conflagrations.

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